

CLAIMS

What is claimed is:

1. A system for packaging a computer system capable of including a plurality of blades, a first plurality of devices, and a second plurality of devices, the system comprising:

5 a chassis having a first cavity, a first plenum, a second plenum and a common plenum therein, the first cavity for retaining the plurality of blades in parallel, the chassis being configured such that air sufficient to cool the plurality of blades is drawn into the chassis;

10 wherein the first plenum is configured such that a first portion of the air is drawn from the plurality of blades into the first plenum, through the first plurality of devices and into the common plenum, the first portion of the air being sufficient to cool the first plurality of devices;

15 wherein the second plenum is configured such that a second portion of the air is drawn from the plurality of blades into the second plenum, through the second plurality of devices and into the common plenum, the second portion of the air being sufficient to cool the second plurality of devices; and

20 wherein the common plenum is configured such that a remaining portion of the air is drawn from the plurality of blades into the common plenum, the first portion of the air is received into the common plenum from the first plurality of devices, and the second portion of the air is received into the common plenum from the second plurality of devices.

2. The system of claim 1 wherein the chassis further includes:

a main chassis having the first cavity and a second cavity therein;

a switch-power-cooling (SPC) chassis configured to fit in the second cavity of the main chassis, the SPC chassis including a first region for the first plurality of devices, a second region for the second plurality of devices, and the common plenum therein, the first plenum and the second plenum being formed between the main chassis and the SPC chassis.

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3. The system of claim 2 wherein the SPC chassis further includes:

a first region and a second region, the first region for retaining the first plurality of devices, the second region for retaining the second plurality of devices, the common plenum residing between the first region and the second region, the first region residing between the first plenum and the common plenum, the second region residing between the second plenum and the common plenum

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4. The system of claim 2 wherein the SPC chassis includes:

at least one cam lever; and

at least one SPC chassis stop, the at least one cam lever and the at least one chassis stop cooperating to lock the SPC chassis in the main chassis when the at least one cam lever is in a first position, and to unlock the SPC chassis and allow the SPC chassis to be removed from the main chassis when the at least one cam lever is in a second position and the at least one chassis stop is depressed.

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5. The system of claim 2 further comprising:

a midplane having at least one central aperture therein, the midplane residing between the plurality of blades and the SPC chassis, the at least one central aperture allowing the remaining portion of air to be drawn into the common plenum.

5 6. The system of claim 2 wherein the SPC chassis further holds at least one blower located at an exit for the common plenum, the at least one blower for expelling the air from the common plenum and wherein the SPC chassis further includes:

a plurality of backflow dampers for each of the at least one blower.

10 7. The system of claim 2 wherein the main chassis includes a plurality of air restriction dampers for each of the plurality of blades, the plurality of air restriction dampers residing between the plurality of blades and the first plenum, the second plenum, and the common plenum, each of the plurality of air restriction dampers closing upon removal of a corresponding blade.

15 8. The system of claim 2 wherein the SPC chassis includes a plurality of catches, wherein the first plurality of devices and the second plurality of devices are packaged in a plurality of modules, each of the plurality of modules including a cam lever, the cam lever for locking the module to the SPC chassis using a corresponding catch of the
20 plurality of catches.

 9. The system of claim 8 wherein the SPC chassis is configured such that each of the plurality of modules is hot pluggable into the SPC chassis.

10. The system of claim 2 wherein the main chassis is further configured to receive an peripheral device, the peripheral device being hot pluggable into the main chassis.

11. The system of claim 2 wherein each of the plurality of blades is hot pluggable into the main chassis.

12. A method for providing a system for packaging a computer system capable of including a plurality of blades, a first plurality of devices, and a second plurality of devices, the method comprising:

determining a blade cooling requirement for the plurality of blades residing in parallel;

determining a first cooling requirement for the first plurality of devices;

determining a second cooling requirement for the second plurality of devices;

determining a difference between the blade cooling requirement and the sum of the first cooling requirement and the second cooling requirement;

accounting for static resistances to air flow in the blade cooling requirement, the first cooling requirement, the second cooling requirement, and the difference;

providing a chassis having a first cavity, a first plenum, a second plenum and a common plenum therein, the first cavity for retaining the plurality of blades in parallel, the chassis being configured such that the blade cooling requirement is satisfied by air sufficient drawn into the chassis and through the plurality of blades, the first plenum being configured such that the first cooling requirement is satisfied by a first portion of the air sufficient drawn into the first plenum from the plurality of blades, through the first plurality of devices

and into the common plenum, wherein the second plenum is configured such that the second cooling requirement is satisfied by a second portion of the air drawn into the second plenum, through the first plurality of devices and into the common plenum, and wherein the common plenum is configured to receiving the difference from the plurality of blades, the first portion of the air from the first plurality of devices, and the second portion of the air from the second plurality of devices.

13. The method of claim 12 wherein the chassis providing step further includes the steps of:

providing a main chassis to includes the first cavity and a second cavity therein;
providing a switch-power-cooling (SPC) chassis configured to fit in the second cavity of the main chassis, the SPC chassis including a first region for the first plurality of devices, a second region for the second plurality of devices, and the common plenum therein, the first plenum and the second plenum being formed between the main chassis and the SPC chassis

14. The method of claim 13 wherein the SPC chassis further includes a first region and a second region therein, the first region for retaining the first plurality of devices, the second region for retaining the second plurality of devices, the common plenum residing between the first region and the second region, the first region residing between the first plenum and the common plenum, the second region residing between the second plenum and the common plenum

15. The method of claim 13 wherein the SPC chassis providing step further includes the steps of:

providing at least one cam lever on the SPC chassis; and

providing at least one SPC chassis stop on the SPC chassis, the at least one cam lever and the at least one chassis stop cooperating to lock the SPC chassis in the main chassis when the at least one cam lever is in a first position, and to unlock the SPC chassis and allow the SPC chassis to be removed from the main chassis when the at least one cam lever is in a second position and the at least one chassis stop is depressed.

16. The method of claim 13 further comprising the step of:

providing a midplane between the plurality of blades and the SPC chassis, the midplane having at least one central aperture therein, the at least one central aperture allowing the remaining portion of air to be drawn into the common plenum.

17. The method of claim 13 wherein the SPC chassis further holds at least one blower located at an exit for the common plenum, the at least one blower for expelling the air from the common plenum and wherein the SPC chassis providing step further includes the step of:

providing a plurality of backflow dampers for each of the at least one blower.

18. The method of claim 13 wherein the main chassis includes a plurality of air restriction dampers for each of the plurality of blades, the plurality of air restriction dampers residing between the plurality of blades and the first plenum, the second plenum, and the

common plenum, each of the plurality of air restriction dampers closing upon removal of a corresponding blade.

19. The method of claim 13 wherein the SPC chassis includes a plurality of catches, wherein the first plurality of devices and the second plurality of devices are packaged in a plurality of modules, each of the plurality of modules including a cam lever, the cam lever for locking the module to the SPC chassis using a corresponding catch of the plurality of catches

20. The method of claim 19 wherein the SPC chassis providing step further includes the step of:

configuring the SPC chassis such that each of the plurality of modules is hot pluggable into the SPC chassis.

21. The method of claim 13 wherein the main chassis providing step further includes the step of:

configuring the main chassis to receive a peripheral device, the peripheral device being hot pluggable into the main chassis.

22. The method of claim 13 wherein the main chassis providing step further includes the step of:

configuring the main chassis such that each of the plurality of blades is hot pluggable into the main chassis.